ABSTRACT OF THE DISCLOSURE

A heat exchanger coil assembly design and method of manufacture increases heat transfer surface area for a given heat exchanger size by increasing the packing density of circuits in the a given coil. The heat exchanger coil assembly preferably increases circuit density uniformly and precisely. This allows the number of circuits in the coil assembly of a heat exchanger to be increased from that which would previously have been considered possible to provide maximum heat transfer surface area for a given heat exchanger size. The coil assembly is made up of arrays of substantially equally spaced apart serpentine circuits located in the coil assembly region of the conduit, with adjacent circuits being arranged in a parallel offset fashion in which adjacent return bends are overlapping. The tubes have an effective diameter of D. Depression areas are provided at the points of overlap to locally reduce the diameter at the overlap. This provides a circuit-to-circuit with a density D/S >1.0, preferably greater than 1.02, where S is the spacing between adjacent circuits and D is the effective diameter of the tubes. The depression areas provide only a minimal increase in internal fluid pressure drop but result in increased heat transfer surface area since additional circuits can be added in a given size constraint application. The increased pressure drop is more than offset by a resultant decrease in internal fluid pressure drop due to the increase in internal flow area. The inventive coil assembly is useful with various types of heat exchangers.